

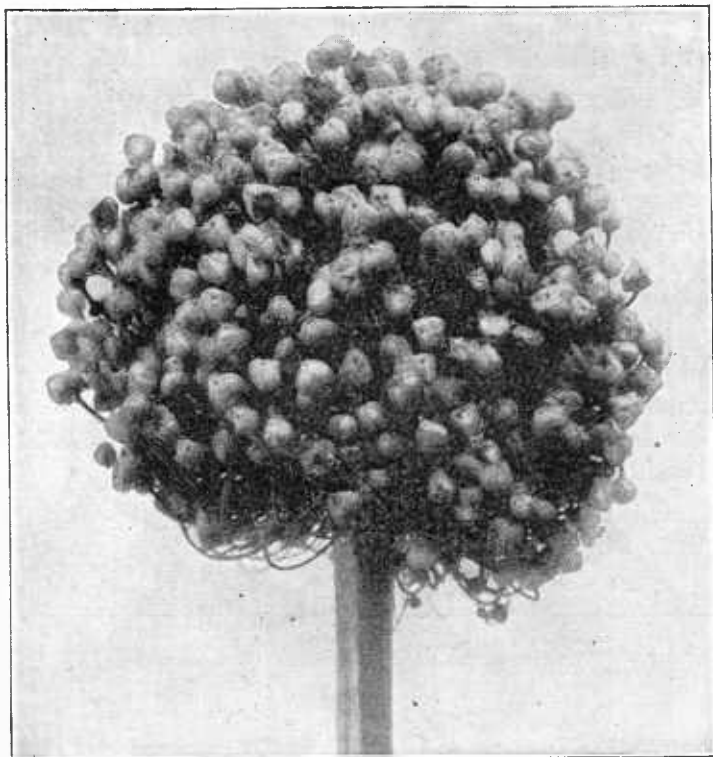
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# SAVING VEGETABLE SEEDS FOR THE HOME AND MARKET GARDEN

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FARMERS' BULLETIN 884 *rev. May 1922*

UNITED STATES DEPARTMENT OF AGRICULTURE

**W**ITH the present urgent necessity for producing increased quantities of food, the seed supply becomes very important.

Where the seed itself is used for food the high prices have tended to throw much-needed seed stocks into the food market, and in many other cases increased plantings have drawn heavily on stocks already low on account of the cutting off of European sources of supply.

As an emergency measure, therefore, it is important that as much seed as possible should be saved on our farms and in our market gardens. It has been done widely in the past and can be done readily again.

This bulletin aims to give plain and explicit directions for saving the seed of our garden vegetables.

Contribution from the Bureau of Plant Industry

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Washington, D. C.

Issued September, 1917; revised May, 1922

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## STATUS OF THE VEGETABLE-SEED SUPPLY.

THE disturbing effect of the world war has been very great on the normal course of the seedsmen's business. In few enterprises had the civilized nations been bound into a more compact unit than in the growing and handling of seeds. Each slight variation of climate and social condition had been taken into account in an attempt to locate the regions where the various seeds should be grown. Each of the many species of plants grown in our gardens became a separate problem, and in many cases varietal characteristics were considered in determining the place and manner of handling the crop. The necessity for readjustment and relocation of growing sources has been largely met, and there is now an abundant supply of most garden seeds. There is opportunity, however, for both home and market gardeners to develop special strains that are adapted to their local conditions. During the war period there were greatly enlarged plantings of vegetables, both on the part of market gardeners and by home gardeners, and it still seems desirable that where special selections or strains of a vegetable have been developed they should continue to save their own seed.

## HOW THE SEED SUPPLY MAY BE PROVIDED.

In earlier times the home saving of seeds was the rule. Many garden varieties are labeled with place names, which usually indicates that they have been developed by community selection at the localities whose names they bear. As late as the middle of the last century many individual market gardeners in this country

jealously guarded the seed of certain varieties and strains which represented years of intelligent selection in their hands. A few such superlative varieties are yet to be found in the possession of gardeners near the old market-gardening centers. In the past also the village and farm gardener saved his own seed of the few varieties of vegetables he grew. This custom has practically ceased, but here and there are farmers and villagers who cling to "family" varieties of certain vegetables. Long-standing local types are probably most common in the Appalachian Mountain region. European gardeners have retained local or family varieties much more tenaciously than Americans.

That there are advantages in thus saving seed where it is grown is generally recognized. This widespread opinion is also held by seedsmen, since the enthusiastic description of a novelty frequently includes a history of its having been secured with great difficulty from a skillful grower in whose possession it had remained for many years or even for generations. These advantages are twofold: (1) The selection which the gardener gives his seed plants, while not greater than that which the seed grower gives his seed stock, is often better than can be given to the seed that is placed on the market; and (2), the plants selected will be the ones which succeed best under the local environment.

The following instructions are directed to methods of seed saving rather than of seed selection, as few persons engaged in any branch of gardening have the insight, patience, perseverance, and enthusiasm required for the development of valuable new varieties of vegetables. Truckers require seed of their specialties in such quantities that it is rarely practicable for them to grow their own supply. It is possible, however, for home and market gardeners to relieve part of the strain on our depleted stocks.

Two varieties of the same vegetable will often cross if seeded together in the same garden. Weather or other conditions sometimes cause a short crop of seed or a failure. Fortunately, well-matured seeds, if properly stored, with the possible exception of those of the parsnip and onion, should retain their vitality for 5 to 10 years. It is thus possible to tide over poor years and to grow all the seed needed for a small garden, even to the extent of handling two or more varieties of one vegetable.

#### **PLANTS WHICH BEAR SEED THE YEAR THEY ARE PLANTED (ANNUALS).**

A large number of garden plants are annuals, including, of necessity, all those of which the seed or the fruit is the part eaten. Only a few of those vegetables of which some part of the growing plant is used for food are annuals.

## VEGETABLES THE SEEDS OF WHICH ARE EATEN.

Very little care is required to save seed for a home supply of the crops of which the seeds are eaten, since the seed is well advanced toward maturity when usable. Selection is important in this group, however, especially to insure healthy seed. Any surplus dried seed of these plants may be used for food.

## BEANS AND PEAS.

The best seed of beans and peas is to be obtained by marking a few of the finest plants with a bit of cloth at the beginning of the harvesting season and allowing the crop of these plants to ripen completely. In making such selections it is best to choose plants alike in varietal character and earliness. When ripened until dry, pull these plants in the early morning, in order to avoid shattering, and hang or spread them in an airy, dry place until the seed is quite hard. Then shell the seed, spread it out not over two or three grains deep, and when thoroughly dry store it for the winter in bags of coarse open-meshed fabric hung in a cool, dry place.

Pods which for any reason have been overlooked when picking beans or peas for the table should be saved, since they can be shelled for seed, though inferior to the selected stock described above. In saving seed from remnant crops of this kind it is well to discard all pods containing only one or two seeds, as these may have come from plants with a tendency to produce poorly filled pods.

Some very destructive bean diseases, including pod-spot, are carried in the seed; so it is extremely important to observe the general rule that no seed should be saved from diseased plants when saving beans for seed. Never save seed from pods which are not bright and clean.

## SWEET CORN.

The best seed corn can be secured by allowing it to ripen on the plant, and, since a single ear will be seed enough for a small garden, it is quite practicable to do this. Select the best and earliest ears by stripping down the husks to examine the grain and to remove any worms that may be found, and then carefully fold them back and hold them in place by an elastic band or a string. Allow these ears to ripen thoroughly on the stalk. In the North it is often better to pull and hang the plant where there will be no danger from moisture, frost, or even chilling until the seed is thoroughly dry. All the ripe ears remaining at the end of the season in any crop of sweet corn should be harvested and saved. The best ears will make passably good seed, and everyone whose early life was spent on a farm remembers the enjoyment that was to be found in parched sweet corn.

Sweet corn spoils much more quickly than field corn, and can not readily be cured in large shocks, but should be husked from the stalk and spread thinly on staging to cure. A convenient way of storing sweet corn is on the ear.

#### VEGETABLES THE FRUITS OF WHICH ARE EATEN.

A fruit, which is developed from a blossom, consists of the seed and its inclosing parts. It is not necessarily fleshy, though that is the popular conception of the term. It is a very simple matter to save seeds of these vegetable fruits. They are in large part allowed to ripen before being brought to the table, and thus there is only the additional trouble of cleaning the seeds, which otherwise would be discarded.

##### CUCUMBERS AND SUMMER SQUASHES.

Cucumbers and summer squashes are used commonly long before they are ripe, or even before they have reached their full size, the one for pickles or for salad, the other as a vegetable. In saving seeds, select and mark fruits of desirable character while in the usable stage and allow them to remain on the vines until fully ripe, which will be indicated by a change of color, or by this change and a hardening of the surface. Split the ripe fruits, scrape out the seed and pulp, and wash them until clean, pouring off the refuse and light, floating seeds. Seedsmen when handling large quantities ferment the mass of seed and pulp from these and other fleshy fruits, but most home gardeners will find it simpler to clean the seed immediately in one operation. Then, spread the washed seed not over two grains deep and place it in the bright sunshine to dry. Stir the seed frequently while drying, but do not subject it to frost or even a severe chill. Any quantity less than a quart of seed should be ready for storing after one day's drying. If a large quantity of seed is being saved, it is important not to bulk it until thoroughly dry, as it heats readily. This will take from two to five days.

##### WINTER SQUASHES, MUSKMELONS, AND WATERMELONS.

The fruits in this group are not used until ripe. Seed saving consists of picking satisfactory fruits of high quality and in washing the seed with water until clean; then spreading, stirring until dry, and storing.

##### TOMATOES.

The character of the tomato plant is of great importance. Select one or more plants which bear a high proportion of good fruits, taking into account size, smoothness, solidity, and freedom from cracking in the fruit, and vigor, productiveness, and freedom from dis-

ease in the plant. Tag the fruits on these selected plants and allow them to ripen on the plant until past their edible condition, but do not permit them to decay. Crush the fruits and separate the skins and denser portions of the flesh by hand or with a coarse sieve, fold the seeds with the softer pulp into a square of coarse muslin or strong cheesecloth, and work this energetically with the fingers under water. It is thus possible to clean the seeds very nicely by forcing the pulp out through the cloth. When clean, spread the seed thinly in an airy place until dry and then store it.

If seed is to be saved in as large a quantity as one-half pound or more it will pay to allow the crushed fruit to ferment for about four days in a cask or bucket, with frequent stirring of the mass. The seeds will settle to the bottom and the pulp will rise to the surface, from which it can be poured. The seed should be washed with pure water until clean, spread out thinly, stirred frequently until dry, and then bagged.

#### EGGPLANT.

For the home garden, seeds of the eggplant in sufficient number can be picked from ripe fruit with a penknife and dried and stored.

#### PEPPERS.

Select well-ripened fruits of peppers, spread the seed thinly until very dry, and then store it.

#### OKRA.

Okra seed for a small garden can be secured best by selecting one or more plants for seed, picking the early pods until the plant is growing vigorously, and then allowing it to set and mature a full crop of pods. The varieties having angular pods will split open and the seed will be lost unless the ripe pods are harvested immediately. The round or velvet podded varieties may be left on the plant until all are ripe, since they do not split open. The seeds after removal from the pods are to be dried and stored.

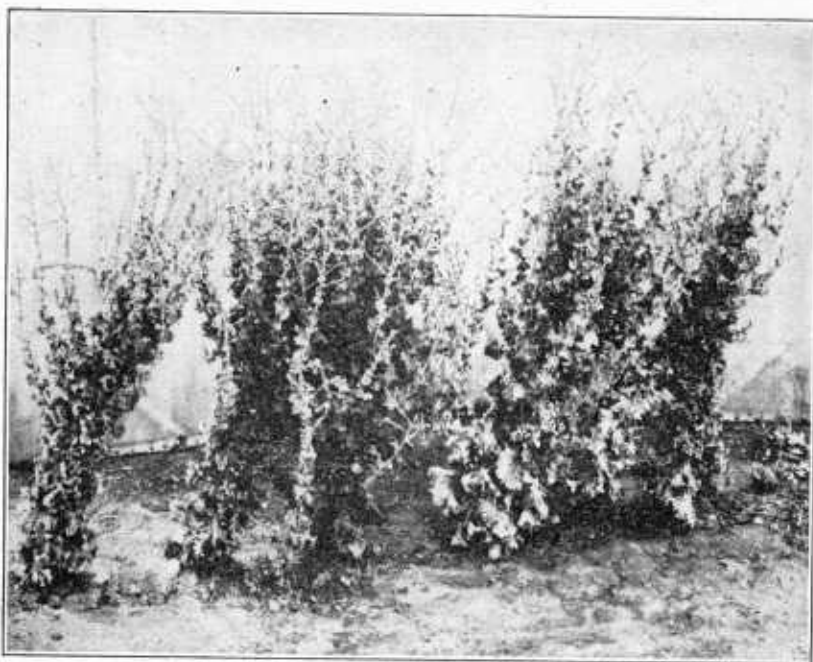
#### ANNUALS THE STEMS OR LEAVES OF WHICH ARE EATEN.

Only two stem-and-leaf vegetables can be grown for seed the first year with any certainty of success.

#### LETTUCE.

Lettuce is an annual crop, and if the seed is planted early enough so that the setting and ripening do not occur during the greatest heat of summer all varieties may be seeded. The safest practice is to start the plants intended for seed in hotbeds or coldframes and then transplant to the garden. As the plants reach edible maturity select a few of the most satisfactory ones for seed, cut out any crowding plants, give the soil a shallow cultivation, and if very dry, water the plants. As the seeding plants develop it may be necessary with





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FIG. 1.—Seedling plants of lettuce. These will soon be ready for harvest.

some of the harder heading sorts to cut or pull the head leaves apart carefully in order to allow the seed stalk to push through.

The seed crop matures slowly, and when the first seed heads open so that there is danger of serious loss from shattering, pull the plants (fig. 1) and put them, roots up, in a paper bag, hanging it in a dry, airy place until the seed is fully ripened. Then thrash it, clean it of bits of stem and dirt by sifting and winnowing, and store in a dry place.

#### MUSTARD.

Mustard seed can readily be grown from a crop sown in very early spring. When the pods have turned yellowish, cut the seed stalks in the early morning and spread them on paper or cloth under shelter. When the pods are quite dry, beat out the seed and spread it thinly for a week or 10 days, as it heats readily if in large bulk.

#### ANNUALS THE ROOTS OF WHICH ARE EATEN.

Only one root vegetable falls into this group.

#### EARLY RADISHES.

Most varieties of early radish planted in the spring as soon as the ground can be worked will produce seed. In such crops some plants will shoot to seed quickly, but they are apt to be the poorest stock and the seed of these can not be depended upon to give good roots. It

is better, therefore, to select carefully some of the finest roots and to cut off most of the top, leaving a few small central leaves. Lay the plants in a moist, airy place for a few hours, or over night, to harden, and carefully set them out with the crown about an inch below the surface. Usually most of them will start into growth and mature a crop of seed. When this ripens, cut the plants and lay them on a sheet exposed to the sun. The seed will harden quickly, and can then be beaten out, thoroughly dried, and stored.

#### PLANTS WHICH REQUIRE A WINTER REST BEFORE PRODUCING SEED (BIENNIALS).

The biennials include nearly all the vegetables of which we use the growing parts, such as stems, leaves, or roots. One must plan beforehand in growing seed of these, since they must be carried over winter and usually require protection.

##### BIENNIALS THE STEMS OR LEAVES OF WHICH ARE EATEN.

###### SPINACH.

Spinach may occasionally be grown for seed as an annual, but to be successful it must be planted very early. The crop which has been wintered over is much better for seed growing. With the protection of a light covering of straw it may be planted in the autumn and wintered over in all parts of the United States. This protection is not necessary south of the latitude of Philadelphia.

As spinach plants come into flower and fruit they may be seen to differ materially; one, which is usually the first to bloom, will produce on tall stems an abundance of pollen, which is easily blown about by the wind, but no seed; the other will produce no pollen, but at each leaf on the upper part of the stem will appear round or more or less prickly fruits, which if the plant stands near one of the first kind will develop seed. Both sorts of plants grown near each other are essential to the production of seed. The seed matures slowly and unevenly and is best saved by pulling the plants and putting them in a paper bag, which should be hung in a protected place until the seed is ripe and dry, when it can be thrashed off, winnowed, and stored.

###### ENDIVE.

To grow seed of the endive it is necessary to plant the crop in the late fall (September in the latitude of Philadelphia), winter over the plants in coldframes, and grow to seeding in the spring. The plants bloom through a long season and should be pulled and hung up to dry when most of the heads are ripe. They are difficult to thrash, but the plant after drying can be placed in a stout bag and beaten until the seeds are released. These must then be sifted, winnowed, and stored.



FIG. 2.—Seedling plants of cabbage. Note that two plants are set together for cross-pollination and that the seed stems are staked.

KALE, COLLARDS, CABBAGE,  
AND KOHL-RABI.

All the plants in this group require the same care in harvesting and curing the seeds. As they shatter from the seed pods very readily, it is best to cut the seed stalks when the pods have turned yellow. Early morning, when the plants are moist with dew, is the best time to harvest.

Spread the seed in a dry, airy place on sheets of paper or cloth to ripen and cure. When the seed is quite hard, beat it out, and spread it in a thin layer for further curing. All these precautions are necessary, because these seeds heat very quickly if not entirely ripe and dry. They will hybridize freely among themselves, so that one should not attempt to grow more than one crop of this group in the same garden at the same time.

Kale and collards are very hardy, and may be left out all winter, with slight protection in the North. They will send up blossom stems early in the spring and mature a crop of seed.

Kohl-rabi should be planted in midsummer, so as to make good-sized "bulbs" for storing in trenches or coldframes. They are set for seed in early spring.

Seed of cabbage in large quantities is grown in many different ways. In some places the stumps from which matured heads have been cut are successfully set for seeding. In Denmark the head and a bit of the stem are cut off and wintered in shallow trenches. In early spring they throw out roots like a giant cutting, start into growth, and produce a good crop of seed. On Long Island, plants are set so late in the season that they do not develop marketable heads before the ground closes up in the fall, but the plants are stored in trenches, given a little protection, and, when set in the spring, will produce a crop of seed. It is possible to grow seed from any part of the cabbage plant that includes a bit of the stem that has wintered so as to be in green and healthy condition. It is generally necessary, however, in order to secure a good yield, to set out two or more plants (fig. 2), as a single plant rarely produces seed.

Plants for seeding should be set as early in spring as practicable and protected from frost, especially if they have been blanched in storing.

## CELERY.

Celery is not grown extensively enough in home gardens to make home seed saving an important consideration. Plants which have been stored for winter, if carried over and planted early in the spring will flower and ripen seed in early summer. The seed is borne in flat-topped clusters and does not ripen all at once. When the larger clusters are ripe the plant should be pulled and hung in a dry, shady place with good ventilation. As soon as the seed is well ripened, beat it off, clean, and store it.

## ONIONS.

The edible part of the onion is composed of the swollen bases of the leaves, which accounts for onions being placed here rather than with root crops. Seed is not produced until the second season, after the bulbs have had a period of rest, but it is essential to the production of good seed that the seed-bearing bulbs should be well rooted.

Often bulbs which have failed to make vigorous root growth will develop blossom heads and seem to set seed, which, however, will be found to have very little vitality. One will be most likely to succeed by selecting well-matured bulbs late in the autumn, setting them so that the crowns are about 3 inches below the surface, and then gradually at the approach of cold weather ridging the earth over them to prevent their freezing. Early in spring, remove the ridges gradually; and as the seed stalks develop, support them by stakes. (Fig. 3.) As the seed pods open



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Fig. 3.—Seeding plants of onion in a home garden. They are in blossom and should be staked.

and the seed turns black before it is ripe, care should be taken not to gather the heads until most of the seed is really ripe, but before it begins to shatter. Cut the seed stalks with about a foot of stem and spread them not more than one head deep in trays lined with paper, in order to save the seed which falls out. Expose these trays to the sun and air until the seed is entirely dry; then rub it out, winnow, and store it.

There are a number of kinds of onions that rarely produce seeds, but are increased by sets or bulblets which grow in the blossom heads, often entirely replacing the blossoms. One group of these, called winter-top, asparagus, or perennial onion, does not make large bulbs, but is extremely hardy. The top sets of these may be planted anywhere in the United States during September and will give a good crop of early spring onions. These sets are easily stored from the time of ripening in midsummer until planting time in the autumn, and no gardener need purchase sets after once getting a stock.

Another group, called spring-top or red-top onions, is not quite so hardy, but the top sets of these will make good-sized dry bulbs for storing. They should be planted as early as possible in the spring. The sets when ripe may be stored in a cool attic or second-story room.

There is yet another type of these onions, called potato or multiplier onions, which does not make either top sets or seed. The bulbs of these split up into a number of bulblets, each of which, if planted in September, will produce large, dry bulbs for winter use the following year. The large onions planted at the same time produce sets. This group is hardy as far north as central Pennsylvania and may be planted in early spring north of that latitude, producing heavy crops in highly enriched soil.

Shallots are similar to the potato onions just described, but they never grow into large bulbs. The two types are frequently confused, and sets of shallots are sometimes sold for potato onions.

#### POTATOES.

Irish potatoes are tubers or swollen stems, and so are grouped here rather than with root crops. For the quantities used in the home garden it is, in general, better for the gardener to rely on his local dealer for a supply of northern-grown seed tubers. If he is located in the North, however, he can successfully save his own seed potatoes. These can be stored in a cold but frost-free cellar if available, but are very satisfactorily kept in an outdoor pit.

For further information in regard to Irish potatoes, see Farmers' Bulletin 533, "Good Seed Potatoes and How to Produce Them," and Farmers' Bulletin 847, "Potato Storage and Storage Houses."

## BIENNIALS THE ROOTS OF WHICH ARE EATEN.

This group comprises all of the root vegetables except early radishes. The part used is the swollen root in which the plant has stored a supply of nourishment for use in the spring to push up its seed stalk in the shortest possible time. It is thus necessary to make seed growing a separate process from crop production.

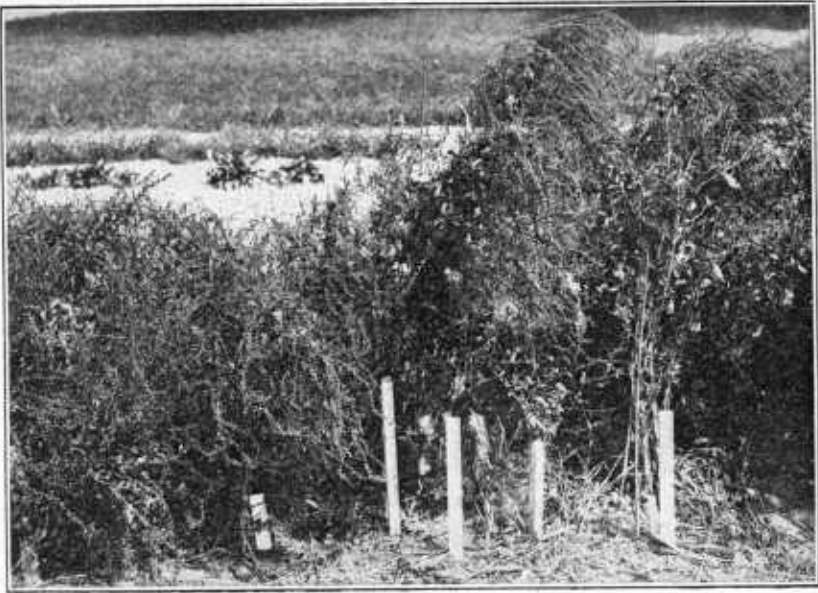
## PARSNIPS AND SALSIFY.

Parsnips and salsify are hardy, and the roots may be safely left in place through the winter. As early in the spring as they can be handled and before they start into growth, the roots should be dug, carefully sorted, and the selected ones immediately reset from 3 to 5 feet apart. They will start into growth at once, and generally will produce a good crop of seed. The parsnip can be safely left in place until the seed crop is fully ripe, when it can be cut and stored under shelter till dry. The heads of salsify open out as they ripen, and unless gathered the seed will be blown away. It is necessary, therefore, to gather the opening heads about noon of every sunny day and spread them in an airy place until dry, when the seed can be rubbed out, winnowed, and stored.

## BEETS, CARROTS, TURNIPS, AND LATE RADISHES.

The roots of the plants in this group must be stored over winter in some way, as they will not endure freezing. Seed can rarely be grown satisfactorily from the large hard roots taken from the spring plantings and can seldom be grown profitably in the home garden. When it is attempted, it is best to make special plantings in midsummer, taking pains to protect the plants from early frost and to pull and store them before severely cold weather. For seeding, select roots of a uniform, desirable character, remove the tops without injuring the central bud, cure by exposing them in the shade for a few days, and bury them. Cover lightly at first, but to an increasing depth as necessary to prevent their freezing. Set reselected roots as early as the ground can be worked, carefully protecting them from frost. As the seed stalks grow, support them by stakes.

Turnips must be harvested as soon as the pods turn yellow, being cut in the early morning to avoid shattering and laid on papers in a protected place. When the seed is ripe, it is readily beaten out, when it is to be winnowed, spread thinly for further curing, and stored when dry.



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FIG. 4.—Seedling plants of beet, planted on the scale required for a home garden. Note that there is more than one plant and that the stalks are staked.

Beets (figs. 4 and 5), carrots, and late radishes may have the seed left on the plant until ripe, when the stems should be cut and dried under shelter. The problem of thrashing and cleaning these three kinds of seed is more difficult than with most seeds. The pods of radish and the seed-bearing branches of the beet and the carrot may be placed in a strong cloth bag and beaten or rubbed until the seed can be successfully winnowed and cleaned for storing.

It is very necessary to plant at least two roots of beets, turnips, or radishes, as isolated plants often fail to produce seed. Carrots also will hybridize with the wild carrots so common as a weed in parts of this country, thus lowering the quality of the crop.

#### LABELING, FUMIGATING, AND STORING VEGETABLE SEEDS.

Seeds which have been grown and carefully saved should be well labeled and stored or all the previous labor goes for nothing. Cloth bags are the best containers for large seeds, such as peas, beans, and corn. They should be used also for larger quantities of small seeds, but for smaller lots, paper envelopes, made at home or purchased, are most desirable. Ordinary letter envelopes are fairly satisfactory, but usually are not gummed so as to close completely, and if handled carelessly small seeds may sift out of them.

Correct labeling is of paramount importance. Every envelope or container should show the kind and variety of seed, the date, in-

cluding month and year when harvested, and the place where grown. For the cloth bags, a slip of paper bearing all this information should be inserted with the seed. It is very convenient also to have a tag on the outside of the bag, but on no account should the inner label be omitted, because of the liability of loss of the outside tag.

Many seeds, especially beans, corn, and lettuce, are subject to injury by a number of insects, all of which may be destroyed by fumigation with carbon disulphid. Carbon disulphid is a liquid that can be purchased in tin cans at any drug store. When poured into a dish it evaporates rapidly, producing a foul-smelling gas that is heavier than air. Therefore, in fumigating seeds, to kill insects attacking them it is necessary to place the carbon disulphid on top of the seeds in order that the gas may sink into them and reach every part of the container. A tight tin pail, box, or barrel makes an excellent container for fumigating seeds. For a tight barrel full of seeds one-half cupful of carbon disulphid is sufficient. For smaller containers, use in proportion.

Seeds to be fumigated must be dry, and if they are in paper bags, the bags should be opened. The gas penetrates cloth bags easily. The liquid may be placed in any shallow dish, such as a saucer or plate, or merely poured on the seeds. The liquid will not injure the seeds if poured directly upon them. Immediately after starting the fumigation, the container should be covered with several thicknesses of heavy paper, or other tight cover, and allowed to remain covered from one to two days. A longer fumigation in tin pails is apt to injure the germinating power of the seeds.



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FIG. 5.—Seeding beets grown on a scale suitable for a market garden.



Carbon disulphid gas is highly inflammable. No lights, or fire of any sort, should be allowed near while fumigation is in progress, or an explosion may occur. The foul odor of the gas disappears after the seeds have been aired for several days.

After the seed has been properly labeled, and fumigated if required, it is necessary to store in a dry, well-ventilated room. Cellars are too moist, attics usually are too hot, but a second-story room furnishes the ideal location. Seed can be protected against mice by storing in tin boxes or mouse-proof wooden boxes, or by suspending in cloth bags.